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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/630,185	07/29/2003	Yezdi Dordi	AMAT/2622.D1/CMP/ECP/RKK	9224

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EXAMINER	
WONG, EDNA	

ART UNIT	PAPER NUMBER
1753	

DATE MAILED: 10/12/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/630,185	DORDI ET AL.	
	Examiner	Art Unit	
	Edna Wong	1753	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 September 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *46-65* is/are pending in the application.

4a) Of the above claim(s) *53-65* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *46-52* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on August 12, 2005 has been entered.

Response to Amendment

This is in response to the Amendment dated September 26, 2005. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Election/Restrictions

Newly submitted claims **53-65** are directed to an invention that is independent or distinct from the invention originally claimed for the following reasons:

Claims 53-59 are directed to an apparatus for electroplating a metal on a substrate plating surface. An apparatus is not an invention that was originally claimed.

Claims 60-65 are directed to a method for plating a metal onto a substrate. An electroless plating method is not an invention that was originally claimed.

Since applicant has received an action on the merits for the originally presented

invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims **53-65** are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

Claim Objections

Claims **47 and 48** are objected to because of the following informalities:

Claim 47

line 2, the word -- of -- should be inserted after the word "flowing".

Claim 48

line 2, the word -- of -- should be inserted after the word "flowing".

Appropriate correction is required.

Claim Rejections - 35 USC § 112

I. Claims **46-52** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 46

lines 11-12, "the electroplating process" lacks antecedent basis.

Claim 47

line 1, it appears that the "rotating" is the same as that recited in claim 46, line 9. However, it is unclear if it is. If it isn't, then what is the difference between them?

lines 2-3, it is unclear what is meant by "and the rinsing the substrate plating surface".

II. Claims **46-52** are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential steps, such omission amounting to a gap between the steps. See MPEP § 2172.01. The omitted steps are: the step of electroplating the metal on the substrate.

Claim 46

lines 3-19, the preamble of the claim recites "A method for electroplating a metal onto a substrate plating surface". However, the body of the claim does not recite any step of electroplating the metal on the substrate.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

I. Claims **46-47 and 49-52** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Ting et al.** (US Patent No. 6,017,437) in combination with **Griego** (US Patent No. 5,879,520).

Ting teaches a method for electroplating a metal onto a substrate **35** plating surface, comprising:

(a) positioning the substrate plating surface face-up on a support member **13** (col. 5, lines 14-17; and Fig. 5);

(b) positioning the support member at a first vertical position in a processing cell (Fig. 5);

(c) flowing an electroplating solution **38** onto the substrate plating surface while rotating **17** the substrate plating surface at the first vertical position (= raised position) [col. 5, line 55 to col. 6, line 4; col. 6, lines 59-62; and Figs. 5 and 7];

(d) capturing the electroplating solution used in the electroplating process with a first fluid receiving member **23** (col. 10, line 65 to col. 11, line 4; and Fig. 5);

(e) positioning the support member at a second vertical position (= lowered position) in the cell, the second position being different from the first position (Fig. 6); and

(f) rinsing the substrate plating surface with a rinsing agent at the second vertical position (col. 11, line 57 to col. 12, line 6).

The method further comprises rotating the substrate during the flowing of the electroplating solution (col. 9, lines 46-49) and the rinsing the substrate plating substrate (col. 11, line 57 to col. 12, line 6).

The method further comprises applying a plating bias (= electrical power) [col. 11, lines 30-34] between the substrate plating surface and an anode positioned above the substrate plating surface (Fig. 5).

The method further comprises spin-drying the substrate (= the wafer **35** is usually spinning at a relatively high rpm to enhance rinsing and drying of the wafer **35**) [col. 11, line 66 to col. 12, line 6].

The method of Ting differs from the instant invention because Ting does not disclose the following:

a. Capturing the rinsing agent with a second fluid receiving member, as recited in claim 46.

Griego teaches that a drain port with multiple return drains provide a method to expose materials being plated to a multiple step chemical process without intermixing the chemistry. The chemical solutions are sequentially returned via the porous ring to the appropriate return drain for a discrete circulation of each chemical solution (col. 3, lines 41-52; and col. 4, lines 7-23).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the method of Ting by capturing the rinsing solution with a second fluid receiving member because this would have exposed materials being plated to a multiple step chemical process without intermixing the chemistry and would have sequentially returned the chemical solutions to the

appropriate return drain for a discrete circulation of each chemical solution as taught by Griego (col. 3, lines 41-52; and col. 4, lines 7-23).

Furthermore, Ting teaches that the delivery and removal of chemicals and fluids to/from a processing chamber are known in the art (col. 10, line 65 to col. 11, line 4).

b. Providing a peripheral seal between the substrate support member and a back side of the substrate, as recited in claim 49.

Ting teaches disposing a seal between the wafer end of the electrode **15** and the interior wall of the sleeve. The seal **42** is positioned adjacent to the interior wall of the sleeve **12** so that it can effectively inhibit the electrolyte from reaching the electrode **15** when power is to be applied to the electrode (col. 8, lines 17-25; and Fig. 9). Furthermore, if flow gaps **43** are located at the bottom of the sleeve-wafer interface, then individual seals, preferably U-shaped, are required at each of the electrode contact locations because of the gaps (col. 8, lines 44-50).

As shown in Fig. 9, the peripheral seal **42** would have also inhibited the electrolyte from reaching the back side of the substrate.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the method described by Ting by providing a peripheral seal between the substrate support member and a back side of the substrate because depending upon the design of the processing cell, the peripheral seal would have been placed to isolate the electrolyte from reaching the undesired areas (Ting, col.

13, lines 1-12).

c. Purifying the rinsing agent captured by the second fluid receiving member, as recited in claim 50.

Ting teaches that the drain **23** is coupled to a container for containing the electrolyte or to *a waste treatment* component of the system. The delivery and removal of such chemicals and fluids to/from a processing chamber are known in the art (col. 10, line 65 to col. 11, line 4).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the method of Ting by purifying the rinsing agent captured by the second fluid receiving member because one having ordinary skill in the art would have been able to recycle and/or reused the rinsing agent. It has been held that changing ecological and economic considerations do not make an obvious expedient into an unobvious improvement. *Ex parte Fuller* 172 USPQ 317.

II. Claim **48** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Ting et al.** (US Patent No. 6,017,437) in combination with **Griego** (US Patent No. 5,879,520) as applied to claims 46-47 and 49-52 above, and further in view of **Wang et al.** (US Patent No. 6,391,166 B1).

Ting and Griego are as applied above and incorporated herein.

The method of Ting and Griego differs from the instant invention because they do

not disclose vibrating the substrate during the flowing of the electroplating solution.

Ting teaches rotating ***or*** oscillating the wafer (col. 6, line 1-4).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the method described by vibrating the substrate during the flowing of the electroplating solution because rotating ***and*** oscillating the wafer would have plated a better uniformity of film as taught by Wang (col. 18, lines 38-52; col. 20, lines 14-21; and Fig. 3B).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Edna Wong whose telephone number is (571) 272-1349. The examiner can normally be reached on Mon-Fri 7:30 am to 4:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on (571) 272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Edna Wong
Primary Examiner
Art Unit 1753

EW
October 4, 2005